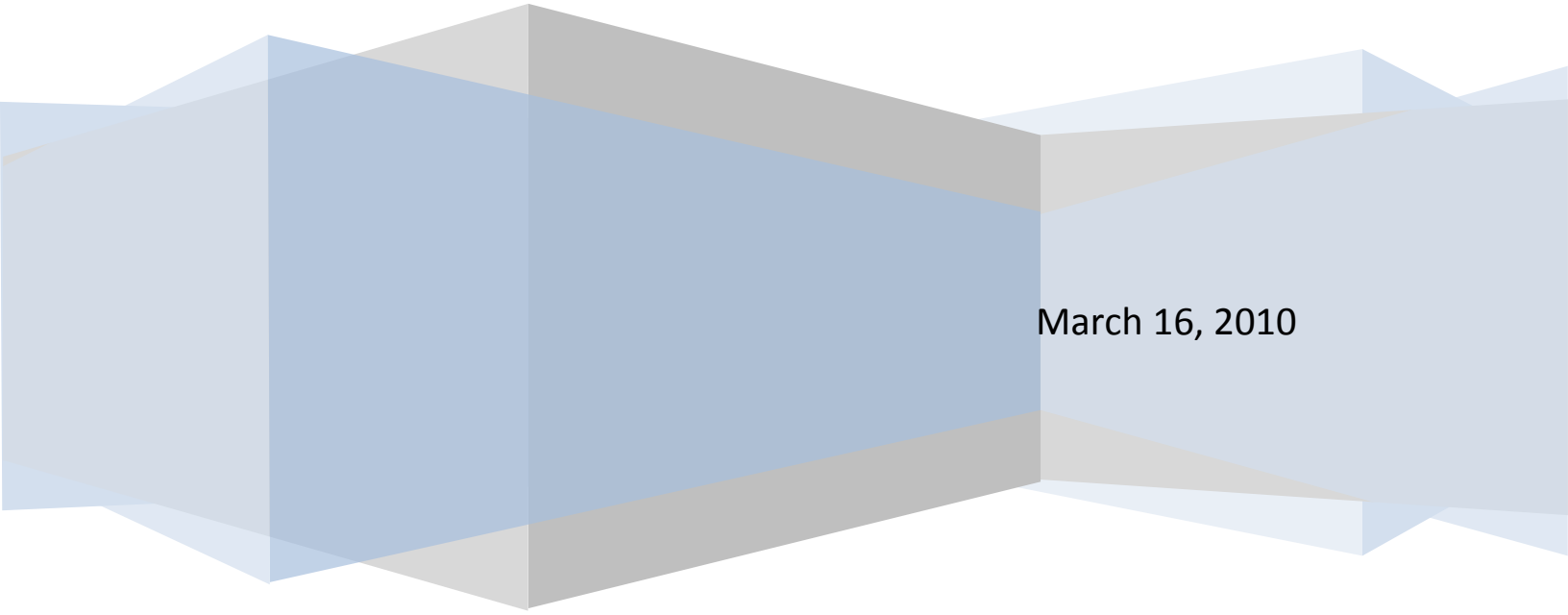
Loudoun County Department of Planning

Route 28 Keynote Employment Policies Comprehensive Plan Amendment
CPAM 2009-0001

Potential Impacts to the Route 28 Corridor Transportation Network

Discussion Paper 4 of 6



March 16, 2010

Introduction

On February 3, 2009, the Board of Supervisors initiated a Comprehensive Plan Amendment, CPAM 2009-0001 Route 28 Keynote Employment Policies, to consider retaining or changing Revised General Plan Keynote Employment land use policies for a specified area within the Route 28 Corridor. On December 15, 2009, the Board of Supervisors approved a workplan for the CPAM that builds upon the significant amount of data and public input gathered through the various Route 28 Corridor activities and initiatives since January 2008. These include the Belfort Park Task Force efforts, the Route 28 Existing Conditions Report, the Route 28 Business Outreach Project, and the Route 28 Market Study. All documents related to the CPAM, including numerous maps of the Route 28 Corridor, are available at www.loudoun.gov/route28.

Phase I of the workplan calls for active participation of Route 28 Stakeholders as work products are developed. To this end, a series of Discussion Papers have been developed on identified topic areas:

- **Economic Development in the Route 28 Corridor**
- **Potential Fiscal Impacts to Loudoun County**
- **Potential Fiscal Impacts to the Route 28 Tax District**
- **Potential Impacts to the Route 28 Corridor Transportation Network**
- **Housing in the Route 28 Corridor**
- **Energy Efficiency and Green Building in the Route 28 Corridor**

Purpose of Discussion Papers

The discussion papers are not intended to be an exhaustive discussion of the topic nor present final conclusions. They are intended to help establish the framework for stakeholder discussions at the upcoming facilitated workshops. Each paper provides a general background on the topic area, describes three general land use concepts that explore development patterns that may be desirable in the corridor, and discusses the advantages and disadvantages associated with each concept. A listing of likely pros and cons for each concept is also included. Although the paper can be viewed as a stand-alone document, a reading of all the discussion papers will provide a more thorough understanding of policy options and stakeholder concerns regarding the Route 28 Corridor. Additional background data and policy or implementation options may be developed and/or refined based on Stakeholder input as the Comprehensive Plan Amendment proceeds.

Background Discussion

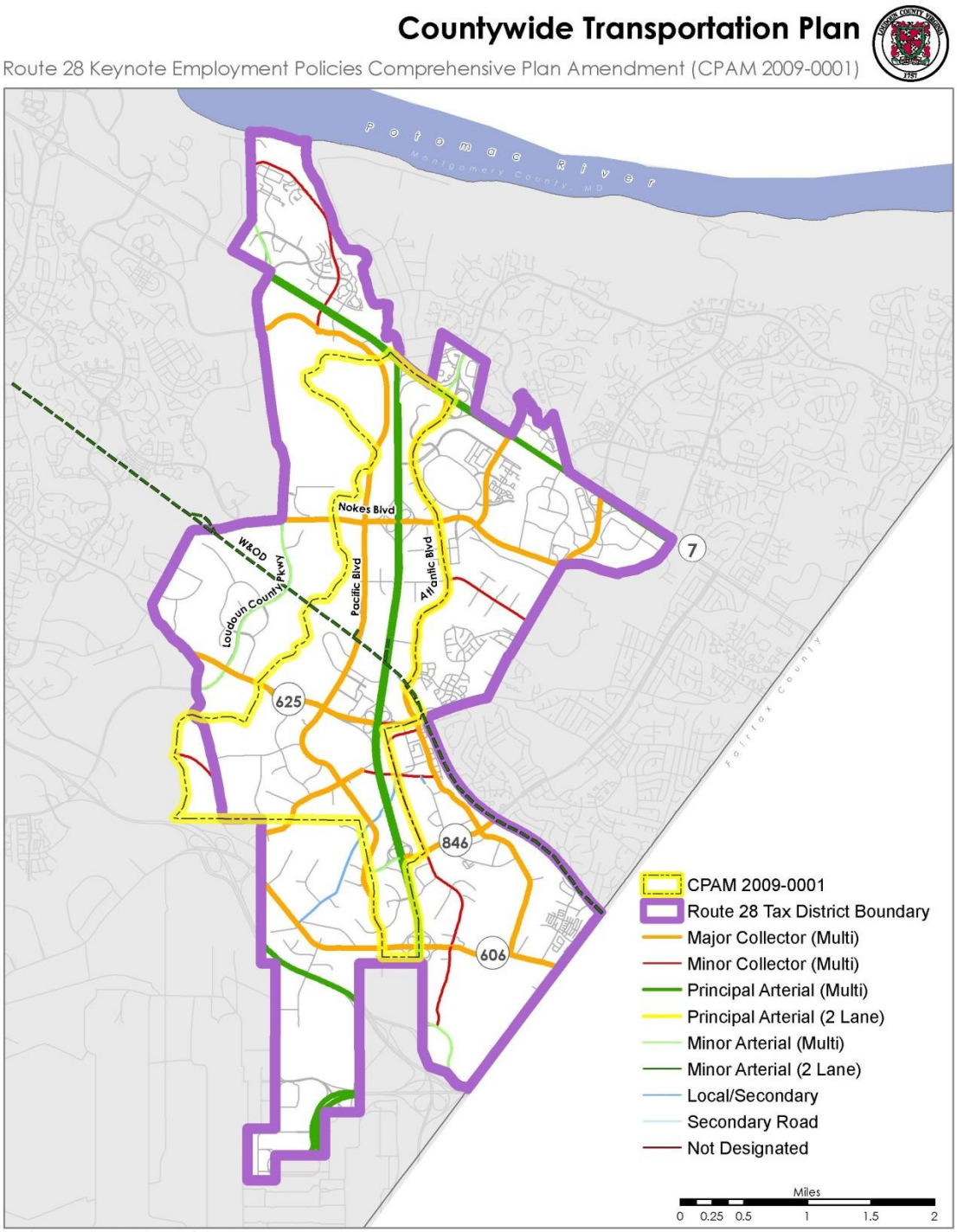
The Route 28 Corridor is one the most heavily traveled transportation artery in Loudoun County, extending from Route 7 in the north to Dulles Airport and the Fairfax County line to the south. Route 28 (Sully Road) in Loudoun County is a 6-mile long, six-lane, limited access, median divided, principal arterial with seven grade-separated interchanges. As of 2008, the latest available data from VDOT, Route 28 has anywhere from 70,000 (at its northern most end), to 111,000 daily trips (where it

intersects the Dulles Toll Road). The roadway functions as a major highway designed for through movement of vehicles at moderate speeds.

Two parallel roads, Atlantic Boulevard to the east, and Pacific Boulevard to the west of Route 28 (Sully Road), provide local north/south access to the corridor. Both Atlantic and Pacific Boulevard are planned as four-lane, controlled access, median divided, major collectors with left- and right-turn lanes at intersections; however portions of these roadways have not been completed. Atlantic and Pacific Boulevard, when completed, will provide relief to overflow traffic from Route 28 and function as the "Main Streets" of the Route 28 corridor.

A series of east/west roadways provide connections to countywide systems and allow local traffic to access the Route 28 Corridor. These east/west roadways, beginning in the north, include future Gloucester Parkway/Nokes Boulevard, Waxpool Road (Route 625) Sterling Boulevard (Route 846) and Old Ox Road (Route 606). They allow traffic to cross from side to side over Route 28 with grade-separated interchanges and provide access to Atlantic and Pacific Boulevard.

There are numerous bicycle and pedestrian facilities planned within the Route 28 Corridor, although the overall network remains incomplete. The Washington & Old Dominion (W&OD) Trail is the most significant non-motorized facility in Eastern Loudoun and in the Route 28 Corridor in particular, providing connections along its route to various neighborhoods and businesses. Nonetheless the high speed traffic, lack of crossing facilities and discontinuous road segments are significant impediments.


Countywide Transportation Plan
Route 28 Keynote Employment Policies Comprehensive Plan Amendment (CPAM 2009-0001)
Potomac River
Montgomery County, MD
Nokes Blvd
W&OD
Loudoun County Pkwy
Pacific Blvd
Atlantic Blvd
7
625
846
606
Fairfax County
CPAM 2009-0001
Route 28 Tax District Boundary
Major Collector (Multi)
Minor Collector (Multi)
Principal Arterial (Multi)
Principal Arterial (2 Lane)
Minor Arterial (Multi)
Minor Arterial (2 Lane)
Local/Secondary
Secondary Road
Not Designated
Miles
0 0.25 0.5 1 1.5 2
Loudoun County Department of Planning
Office of Transportation Services
Loudoun County Office of Mapping and Geographic Information
Date Mapped 2.16.2010
Map Number 2010.015

Presently, the Route 28 Corridor is served by both commuter and local bus service. Commuter bus service is provided during weekday peak periods with access to the West Falls Church Metrorail Station in Fairfax County and to locations within the core of the Washington, DC metropolitan area. Limited reverse commute service is also provided from the West Falls Church Metrorail Station to major employers within the Route 28 Corridor. Local bus service is also provided within the Route 28 Corridor on four fixed routes. The County is currently developing a County Transit Service and Infrastructure Plan as part of the update to the *Revised Countywide Transportation Plan* (CTP) to guide implementation of public transit alternatives over the next 20 years. The planned arrival of Metrorail is anticipated as part of these future transit plans, with the proposed Route 606 station (adjacent to the location of the existing Dulles North Transit Center) and the Route 28/CIT station just inside the Fairfax County line in the median of the Dulles Toll Road, likely to have the most significant effect on parts of the Route 28 Corridor in terms of commuting patterns and deployment of local feeder bus service to the station.

The Route 28 Corridor has been identified as Loudoun County's premier business and employment corridor. The completion of the roadway network and continued transportation improvements within the corridor are vital to the economic vitality of the area. The transportation challenge for the Route 28 Corridor is in maintaining the appropriate balance between land use and transportation demands to support expected growth in the corridor. Improved access to transit, notably the arrival of Metro and the development of more extensive bus service to the corridor will enhance transit circulator services in the corridor, reducing the dependence on auto-oriented travel in the future. Additionally, as Loudoun County begins to consider climate change and energy consumption, the emphasis of travel demand management (TDM) can be expected to shift from managing traffic congestion to also reducing greenhouse gas emissions and the County's carbon footprint.

Public Input *(Route 28 Business Outreach Project, Belfort Park Task Force and Route 28 Market Study[1])*

The Route 28 Business Outreach Project Results Report highlighted that stakeholders believe that while transportation improvements to Route 28 are resulting in increased capacity and improved traffic flow, the recent improvements have facilitated through-commuter traffic for employees driving from the south and west, partly due to commuters using the roadway to avoid the high toll rates on the Dulles Greenway. Many perceive Route 28 as a concrete highway that does not have the greenery and

[1] During March and April, 2009, County staff conducted one-on-one interviews with Route 28 Corridor stakeholders to obtain their perceptions of the corridor, its current state of development, challenges for the future, and ways the County could improve the corridor's development potential. Additionally, stakeholder comments made during a Board of Supervisors-sponsored Breakfast Forum, also held in April 2009, supplemented comments received during the interviews. County staff documented the results of these efforts in the *Route 28 Business Outreach Project Results Report*, June 2, 2009. Following the Outreach effort, the County contracted with a private consultant to perform a Route 28 market analysis to assess the corridor's potential for Class A office space under current conditions and recommend a vision for maximizing the economic development potential of the overall corridor. The consultant presented the results of the market analysis in the *Route 28 Corridor Analysis of Development Potential for Class A Office Space*, August 27, 2009. Both of these reports are available at www.loudoun.gov/route28.

aesthetic appeal of the Route 7 and Dulles Greenway corridors and acts as a physical barrier between Sterling and development to the west, thus far precluding any opportunities to tie development together. Stakeholders noted that the parallel roads of Atlantic and Pacific Boulevards, are being developed with no consideration for a safe and connected pedestrian and bicycle network, forcing employees to access amenities and services by getting into their cars. Overall, stakeholders believe opportunities exist to develop a planned transit network that includes either transit spurs or a looped system that links business districts with metrorail and with Dulles Airport. A seamless transit network means that employers can recruit from a regional labor pool that has greater reverse commute options for employees from the east. Employees who live near transit would also have the option of travelling to Dulles Airport or to their jobs without ever entering a car.

Stakeholders also noted that roadways in the corridor have been developed with no consideration for a safe and connected pedestrian and bicycle network. The end result should be a pedestrian and multi-modal network throughout the corridor that ties development, the planned transit network, and open space together in an interconnected system.

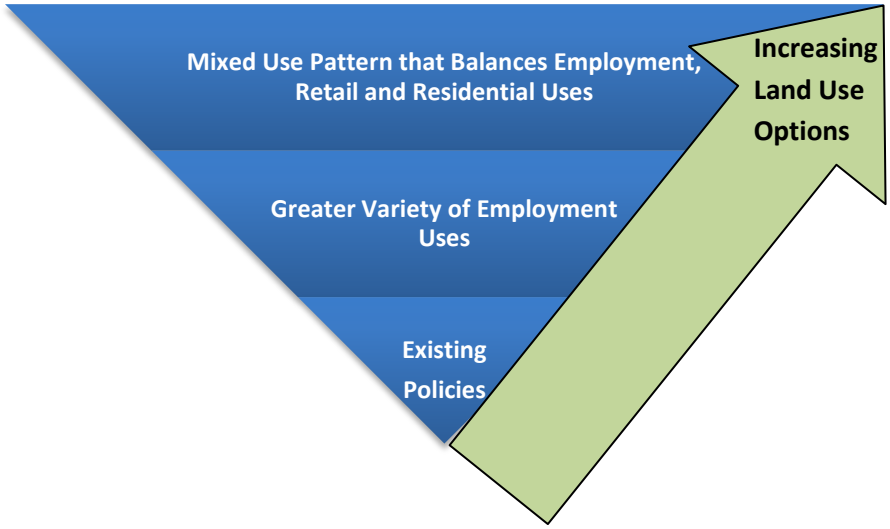
The *Route 28 Corridor Analysis of Development Potential* by Fulton Research, Inc. (August 27, 2009) found that present and future capacity due to interchange improvements along Route 28 and planned improvements for Atlantic and Pacific Boulevards are unique advantages to the corridor's economic future. The report further states the ability to walk and bike safely are an integral part of current and future trends and that as Loudoun County contemplates development and redevelopment of the corridor, consideration should be given to the design of streets, sidewalks, paths and public spaces to provide the desired elements of connectivity and multi-modal travel.

Analysis of Possible Land Use Concepts

For the purposes of this discussion, three possible land use concepts are compared to determine what potential effects they may have on the transportation network within the Route 28 corridor. The pros and cons associated with each concept are also discussed.

In order to inform the discussion, the concepts were compared against the draft Revised Countywide Transportation Plan (CTP), which uses current planned land use to determine the required transportation network over the long-term. The draft CTP is currently under review by the Planning Commission and is expected to be before the Board of Supervisors in April. The operation of the draft CTP network is described in terms of level of service (LOS). Level of service is the term that describes how well a roadway operates and is measured on a scale from 'A' to 'F,' with 'A' being the best, and 'F' being the worst. In Loudoun County, LOS D or better is considered to be acceptable. A horizon year of 2030 was used in this evaluation to correspond with the draft CTP. Determination of potential impacts to the transportation network under each of the concepts was made using available data and engineering judgment, based on known characteristics of trip generation as supported by transportation

studies and field data. In order to provide a more detailed analysis of the impacts of the concepts on the transportation network, the concepts would need to be further defined with sufficient specificity provided so that Concepts 2 and 3 could be modeled using transportation modeling software. The three concepts provide a continuum of increasing land development options, as illustrated in the figure below.



Concept 1: Existing Policies Retained in the Route 28 Corridor.

Under this concept, the existing Keynote Employment and Destination Retail policies of the Revised General Plan would continue to guide land development within the Route 28 Corridor. Keynote Employment Centers are 100-percent office or research-and-development centers that generate high-traffic volumes and are supported by ancillary retail and personal services for employees. Residential development is not permitted in these areas. The Route 28 corridor also contains three Destination Retail Overlays which provide an additional development option for properties located within these areas. Destination retail is comprised of large scale retail uses that demand a regional market, and rely heavily on automobile access. They are intended to be located outside of residential areas along planned and future principal arterial corridors where the County's transportation network can accommodate auto intense retail uses.

The Route 28 corridor has not been developed to date with the highest and best uses envisioned by the Revised General Plan primarily due to existing Zoning Districts and the small parcel ownership pattern. If existing land use and zoning policies remain in the corridor, unless the market for office development in the County significantly changes, the corridor's existing trend towards underdevelopment (0.24 FAR on average within the Route 28 Corridor) could continue.

Transportation Impacts

Road Network

As this concept reflects existing planned land use and current zoning for the Route 28 Corridor, the projected traffic volumes associated with the concept have already been forecasted for the year 2030 as part of the update to the *Revised Countywide Transportation Plan*. As such, the performance of the planned road network has been evaluated and recommendations have been made (as part of the draft update) to improve the network to meet anticipated demand.

In 2030, with the CTP network in place, much of the corridor is projected to operate at acceptable or near-acceptable levels of service. Model runs of the CTP network show that Route 28 is projected to operate at acceptable levels of service (LOS C or better is projected to occur) from Waxpool Road north to Route 7.

South of Waxpool Road, the projected performance of the corridor begins to deteriorate. For certain model runs, between Waxpool Road and Route 606, the corridor is projected to operate at levels of service D and E (acceptable and near-acceptable levels). This deterioration reflects commuting patterns of the region and the accumulation of vehicle trips approaching the toll road corridor. Other model runs show the network performs slightly worse, with a short segment projected to operate at LOS F. However, it should be noted that the recommended cross sections included in all model runs for Route 28 are identical, and the difference in projected levels of service is more a result of slight shifts in traffic volumes in the network around the corridor and may not necessarily be an indicator of worsened performance.

Between Route 606 and the Fairfax County line, the network is projected to operate at LOS F. While this reflects an undesirable operating condition, it is not surprising given the aforementioned commuting patterns in the region and the further accumulation of vehicle trips approaching the Toll Road corridor. The draft CTP calls for the addition of 2 new planned lanes (for a total of ten) from Route 606 south into Fairfax County to help ease congestion at this location. The draft CTP also recommends consideration of HOV lanes as a part of a coordinated network

One additional measure that has been proposed as part of the ongoing interjurisdictional effort with Fairfax County and the Town of Herndon, is to extend Atlantic Boulevard/Davis Drive south of Route 606 and across the toll road into Fairfax County. While this has not been analyzed as part of the CTP process, and is therefore not reflected in the 2030 projected levels of service, it is reasonable to assume that the new connection would provide additional relief to this segment of Route 28.

On Atlantic Boulevard and Pacific Boulevard, the Route 28 Corridor's parallel reliever facilities, each are projected to operate at LOS C or better throughout their entire length in the year 2030.

Transit

The draft CTP recommends a robust package of transit alternatives that would serve to ease congestion within the entire corridor. These alternatives would be timed to coordinate with the planned Dulles Corridor Metrorail Project, including services to be implemented prior to the extension of rail to Wiehle Avenue (Phase I), services planned to coordinate with rail completed to Wiehle Avenue (Phase II), and ultimately services designed to coordinate with rail extended into Loudoun County (Phase III).

Phase I service would include an "Atlantic Circulator," a peak period commuter-oriented local fixed route bus service between Dulles Town Center and the Dulles North Transit Center with buses traveling along Atlantic Boulevard, Pacific Boulevard and local streets surrounding those arterials. Phase I would also include an inter-county fixed route bus service extending through Prince William County to Manassas. It would include service to Dulles Airport and limited stops focused on transfer points in order to ensure reasonable travel times. An express bus service route is planned for Phase I, originating at the Dulles Town Center, and providing access via Route 28 and the Dulles Corridor to Herndon/Monroe, Reston and Tysons Corner. Finally, a commuter bus service route is planned for Phase I, originating at the Ashburn North park and ride lot at the northern end of the corridor, and carrying passengers into downtown Washington, D.C.

For Phases II and III, most of the routes would continue in some form, but typically with variations to coordinate the service with the Metrorail extension. The Atlantic Circulator would be extended to serve the Wiehle Avenue Metrorail station in Phase II, and then in Phase III would end at the Route 772 Metrorail station. Also, for Phase II, a new Pacific Circulator would be created to account for the completion of Pacific Boulevard on the west side of Route 28. The inter-county service to Manassas would continue unchanged for Phase II, but would be modified in Phase III to move the airport stop to the Route 28 Metrorail station. The Dulles Town Center express route would end at Wiehle Avenue in Phase II, and would be replaced by Metrorail and the Atlantic Circulator in Phase III. Finally, the Ashburn North commuter route would remain the same for each of the Phases, but in Phase III, as an alternative to Metrorail, would require self-sustaining fares.

Pros

- No change required, overall existing and planned transportation network will accommodate future growth.

Cons

- Although the planned transportation network is designed to accommodate future growth, the Draft CTP analysis shows the potential for failing levels of service at the southern end of the corridor under planned land use despite incorporation of mitigation measures.

Concept 2: Route 28 Corridor includes a Greater Variety of Employment Uses (no residential).

Under this concept, the land use policies guiding the development of the Route 28 corridor would be revised to create a premiere business corridor with emphasis on the development of Class A Office and a

greater variety of employment uses. Under this concept no residential uses would be permitted and the current Destination Retail overlay would be eliminated or significantly reduced to permit further development of office, commercial and employment uses.

Transportation Impacts

Unlike Concept 1, this concept has not been evaluated using the County's transportation model. As such, detailed data on the performance of the network under such a concept is not available. However, generalized conclusions regarding the impacts of the changes in land use policies on the transportation network may be made by taking into account the known trip generation characteristics of the alternative land uses.

Road Network

Under this concept, the land use policy is revised to emphasize development of Class A Office, and employment uses within the corridor. Such a focus on office-type uses would mean that other uses that are higher trip generators, such as destination retail, would not occur. Depending on the intensity of the office and employment uses, projected trip generation within the corridor could potentially drop when compared to Concept 1. As defined in Institute of Transportation Engineers' *Trip Generation*, 8th Edition, a general office building generates an average of approximately 11 trips per 1,000 square feet of office space, which is a relatively low trip generation when compared to other more intense uses.

Overall, this concept would likely have the least impact on the road network due to its focus almost exclusively on a less-intense form of land use. If this concept were pursued, it could potentially lead to improved levels of service along the corridor (as compared to the other concepts), depending on the intensities and location(s) of the uses. In the southern end of the Route 28 Corridor, such an improvement would be especially beneficial as current projections estimate failing levels of service for the year 2030.

Transit

As discussed above, it is likely that Concept 2, would be the least intense of the three concepts. Consistent with the road network discussion, there would likely be less demand for transit services. It is difficult to determine the magnitude of that change without additional data, however it would seem that the transit services as planned for under Concept 1, would continue to be required in some form. This is due to the fact that the fundamental characteristics of this corridor that drive the need for these routes would not be altered, including the draw of commuters to employment within the corridor, and the draw of commuters out of the corridor to employment in Fairfax and beyond. As such, the local fixed-route circulators, express bus route, inter-county route and commuter route would all remain in play. Of the routes that have been discussed, it would seem that the local fixed-route circulators would be affected most by a drop in demand and might require some modification.

Pros

- Depending on the intensity of the office uses, projected trip generation within the corridor could potentially drop when compared to the baseline concept that includes destination retail; reduced traffic volume on Route 28 may alleviate some level of service concerns as observed under baseline scenario.
- Critical mass will likely be achieved through additional employees in the corridor to facilitate bus rapid transit and connections to planned Metro which could further reduce vehicular traffic in the corridor.
- Synergy created by mixed-use commercial development will promote pedestrian activity and reduce vehicular traffic in the corridor.

Cons

- Continued campus style office and employment uses would reduce the potential for synergy between adjacent land uses and thus increase the reliance on single occupancy vehicles for local trips.
- Concept 2 will require additional refinement and transportation modeling to fully analyze potential effects on the corridor which are beyond the scope of this discussion.

Concept 3: Route 28 Corridor Policies Emphasize a Mixed Use Pattern That Balances Employment, Retail, and Residential Uses

Under this concept, the land use policies guiding the development of the Route 28 corridor would be revised to allow for a greater mixture of land uses, including residential, with the goal of enhancing its economic development potential and providing the greatest fiscal benefit to the County. Specific policy changes could include expanding the definition of Keynote Employment within the corridor to promote a greater variety of Class A office settings and uses than currently allowed while, at the same time, retaining the ability to create single user, park-like office campuses, which is a unique opportunity in Loudoun County. Residential uses (predominately multi-family units) could be considered throughout the entire length of the corridor under specific criteria or in certain nodes (such as the northern and southern gateways) where centers of activity are desired.

Transportation Impacts

As with Concept 2, this concept has not been evaluated using the County's transportation model, and therefore data on the performance of the road network under such a concept is unavailable. Again however, generalized conclusions can be made regarding the concept's potential impacts to the transportation network.

Road Network

This concept calls for a greater mixture of land uses, including residential, retail and hotel uses among the desired office and employment uses. This implies that a certain portion of the planned office development within the Route 28 Corridor would be replaced with residential, retail and hotel uses. As previously stated, a general office building generates an average of approximately 11 trips per 1,000 square feet of office space. A typical residential condominium/townhouse generates an average of

approximately 6 trips per dwelling unit. Both of these business and residential uses are relatively low trip generators. Retail/commercial uses, however, can generate potentially hundreds of trips per 1,000 square feet, depending on the use. While it is understood that there would be some synergy between the various land uses, and thus fewer trips generated under this mixed use concept than if each of the proposed uses were to occur in isolation (a phenomenon known as internal capture), accepted reductions (for planning purposes) are typically no greater than 15%, depending on the uses. Therefore, it is reasonable to assume that there would be an increase in overall trips generated under this concept as compared to Concept 1 and Concept 2 . Depending on the extent of the inclusion of retail uses and other residential supportive uses, the increase in trip generation could be substantial.

If this concept were to be pursued, careful attention would need to be paid to the magnitude of retail uses proposed, and also the location(s). Under Concept 1, from the analysis performed as part of the update to the *Revised Countywide Transportation Plan*, it was shown that Route 28 is projected to have acceptable levels of service for the year 2030 north of Waxpool Road. However, as one moves further south along Route 28, level of service is projected to deteriorate during the peak periods, attaining LOS F near the Fairfax County border. Given this understanding of the analysis of the baseline concept, some conclusions may be drawn with respect to the current concept. Because the northernmost segment of the corridor is projected to have a level of service of C or better, it has some excess capacity to absorb additional trips. As such, any concept that would propose additional trips over and above the baseline concept might best be added to the network at this location. Further south, the level of congestion increases commensurate with commuting patterns and thus has less ability to accommodate additional trips. This is not to say that mixed use should be ruled out for the southern end of the corridor, however, the intensity of retail development should be carefully monitored. Also, some of the issues with the performance of the network in this portion of the corridor could also be potentially obviated with the proposal for the bridge across the Toll Road, thus accommodating additional retail uses.

Transit

As with the analysis of the Highway network for Concept 2, transit has not been analyzed to determine the specific needs of such a situation. However, it is safe to say that with a more intense level of development, transit would likely need to play an even larger role in the function of the transportation network. The current plan for transit in the Route 28 corridor would put in place a strong framework of services, including the Atlantic and Pacific Circulators (the local fixed-route bus services), as well as the inter-county route to Manassas, the express route from Dulles Town Center to Fairfax, and the Ashburn North commuter route to Washington, D.C. In the case of the Atlantic and Pacific Boulevard Circulators, these services would likely remain in place, but require additional runs with reduced headways to keep up with demand. These routes might also require slight modifications depending on where the more intense land uses are located. With the introduction of residential land uses into the corridor, it is reasonable to expect that although a certain percentage of residents might work within the corridor, many would continue the trend of working in either Fairfax County or downtown Washington. This

would put additional demand on both the express route from Dulles Town Center to Fairfax, and also the commuter route from the Ashburn North park and ride lot into Washington, D.C. Again, higher levels of demand would require additional runs at reduced headways. Also, additional park and ride lot capacity would be necessary to handle increased numbers of commuters.

Pros

- Mixed- use business, retail and residential development in the corridor create the potential for synergy between land uses, thus decreasing the reliance on single occupancy vehicles for local trips.
- Critical mass could be achieved through residential development to facilitate pedestrian and bicycle mobility for residents and employees in the corridor which could reduce vehicular traffic in the corridor.

Cons

- Retail/commercial uses required to support residential uses in the corridor generate more vehicular trips then business development.
- Land use and travel demand distribution associated with residential and retail uses in the corridor will likely require additional infrastructure to enhance vehicular as well as pedestrian and bicycle mobility.
- Permitting the type of residential envisioned for the corridor (predominately multi-family units) will increase the number of employees who live and potentially work in the corridor, however, because easy access to major transportation corridors exists, residents may continue to work outside the corridor in employment areas in Fairfax or downtown Washington.
- Services needed for residential uses may not exist in the corridor and may place a higher demand on the transportation infrastructure outside the corridor.
- Concept 3 will require additional refinement and transportation modeling to fully analyze potential effects on the corridor which are beyond the scope of this discussion.